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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/904,875	07/16/2001	Takamitsu Asanuma	110108	1757

25944 7590 11/01/2005

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EXAMINER
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NGUYEN, TU MINH

ART UNIT	PAPER NUMBER
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3748

DATE MAILED: 11/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/904,875

Applicant(s)

ASANUMA ET AL.

Examiner

Tu M. Nguyen

Art Unit

3748

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. An Applicant's Request for Continued Examination (RCE) and an Applicant's Amendment filed on October 11, 2005 have been entered. Claim 2 has been amended. Overall, claims 2-4 are pending in the application.

#### ***Drawings***

2. The formal drawings filed on November 25, 2003 have been approved for entry.

#### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dou et al. (U.S. Patent Application Publication 2001/0035006) in view of Hirota et al. (Japan Publication 6-159037).

Re claim 2, as depicted in Figure 17, Dou et al. disclose a device for purifying the exhaust gas of an internal combustion engine, comprising:

- a particulate filter (6) arranged in the exhaust system (see claim 10);

Art Unit: 3748

- a NOx adsorber (4) carries a catalyst for absorbing and reducing NOx, the catalyst absorbing NOx when the air-fuel ratio in the surrounding atmosphere thereof is lean and releasing the absorbed NOx to purify NOx by reduction when the air-fuel ratio is stoichiometric or rich;

- a catalytic apparatus (3) for purifying NOx arranged in the exhaust system upstream of the particulate filter, which catalytic apparatus carries a catalyst (noble metals, barium) absorbing NOx when the air-fuel ratio in the surrounding atmosphere thereof is lean and releasing the absorbed NOx when said air-fuel ratio is stoichiometric or rich (see paragraphs 0039, 0041, and 0042);

- control means (2A or 2B) for making the air-fuel ratio in the catalytic apparatus (3) rich to release NOx from the catalyst of the catalytic apparatus to purify the released NOx by reduction and making the air-fuel ratio in the NOx adsorber (4) rich to release NOx from the catalyst of the NOx adsorber to purify the released NOx by reduction; and

- bypassing means (5A) to make possible the exhaust gas bypass the NOx adsorber and the particulate filter located downstream of the catalytic apparatus (3).

Dou et al., however, fail to disclose that the particulate filter and the NOx absorber can be combined into one single housing.

As shown in Figures 1 and 2, Hirota et al. teach that it is conventional in the art to use a catalyzed particulate filter (10) which carries a NOx absorber (26) for absorbing and reducing NOx. As clearly illustrated in Figure 2, the catalyzed particulate filter is a wall-flow device comprising a plurality of partition walls having pores, the partition walls carrying a NOx absorber (26) on the exhaust gas upstream side surface for absorbing and reducing NOx. A

Art Unit: 3748

controller in Hirota et al. makes the air-fuel ratio in the catalyzed particulate filter rich to release NO<sub>x</sub> and active-oxygen from the NO<sub>x</sub> absorber to purify the released NO<sub>x</sub> by reduction, and to oxidize the particulates trapped on the filter by the released active-oxygen. As indicated in the translated Abstract, the heating in the NO<sub>x</sub> releasing and reduction causes elevated temperature in the filter, which induces the trapped soot to be oxidized easily. It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have replaced the NO<sub>x</sub> absorber and the particulate filter in Dou et al. with the catalyzed particulate filter taught by Hirota et al., since the application thereof would have reduced spacing in the device and saved fuel by inducing soot to combust at an earlier time.

Hirota et al., however, fail to teach or suggest that the trapped soot is oxidized without producing a luminous flame.

Since the heating in the NO<sub>x</sub> releasing and reduction in Hirota et al. causes elevated temperature in the filter, which induces the trapped soot to be oxidized easily, the trapped soot is also oxidized at a lower temperature. One with ordinary skill in the art also recognizes that at a lower temperature, the trapped soot in Hirota et al. is oxidized without producing a luminous flame. Moreover, since the particulate filter in Hirota et al. is operated in an exact manner as that in the pending application to oxidize the trapped soot, there is a similar functionality between Hirota et al. and the pending application. This similar functionality leads one with ordinary skill in the art to realize that the trapped soot in Hirota et al. is also oxidized without producing a luminous flame.

Re claim 3, in the modified device of Dou et al., the catalytic apparatus (3) carries the catalyst (noble metals, barium) for absorbing and reducing NO<sub>x</sub>, and during the recovery process

Art Unit: 3748

of the SO<sub>x</sub> pollution of the catalytic apparatus, the bypassing means (5A) makes the exhaust gas bypass the catalyzed particulate filter (see the last 8 lines of paragraph 0062).

Re claim 4, in the modified device of Dou et al., the catalytic apparatus (3) carries the catalyst (noble metals, barium) for absorbing and reducing NO<sub>x</sub>, and immediately after the finishing of the recovery process of the SO<sub>x</sub> pollution of the catalytic apparatus, the bypassing means (5A) does not make the exhaust gas bypass the catalyzed particulate filter and thus the exhaust gas passes through the catalyzed particulate filter.

#### *Response to Arguments*

5. Applicant's arguments with respect to the reference applied in the previous Office Action have been fully considered but are moot in view of the new ground(s) of rejection.

#### *Prior Art*

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of one patent: Martin et al. (U.S. Patent 6,003,305) disclose a flameless thermal oxidizer for soot.

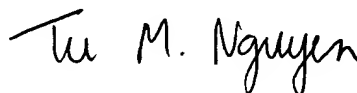
Art Unit: 3748

*Communication*

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (571) 272-4862.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



TMN

Tu M. Nguyen

October 30, 2005

Primary Examiner

Art Unit 3748